

**Amendments to the Claims:**

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A thickness measurement system for measuring a film thickness of a sample, comprising:

an electromagnetic cavity resonator having an exposed side adapted to contact a portion of the surface of the sample;

~~an attachment assembly adapted to press the cavity resonator to the portion of the surface of the sample;~~

a suction assembly to apply a pressure to the cavity resonator to secure the cavity resonator to the measurement sample;

a signal decoupler coupled to the cavity resonator;

a signal amplitude detector coupled to the decoupler;

a processing unit coupled to the amplitude detector that processes;

a frequency signal generator coupled to the processing unit and to the decoupler;

~~a processing unit coupled to the amplitude detector that processes; and~~

a correlating algorithm correlating a resonant frequency shift detected by the amplitude detector to the film thickness of the portion of the surface of the sample being measured, wherein during the measurement the exposed side of the cavity resonator is pressed against the portion of the surface of the sample.

2. (Original) The thickness measurement system of claim 1, wherein the electromagnetic cavity resonator has a plurality of cavities.

3. (Previously presented) The thickness measurement system of claim 1, wherein the frequency signal generator is one of a Gunnplexer or a Gunn Diode.
4. (Canceled)
5. (Original) The thickness measurement system of claim 1, wherein the amplitude detector detects a voltage.
6. (Original) The thickness measurement system of claim 1, wherein the amplitude detector detects a power.
7. (Currently amended) The thickness measurement system of claim 1, further comprising a DC supply coupled to the frequency signal generator.
8. (Previously presented) The thickness measurement system of claim 1, further comprising a varactor DC supply capable of controlling a frequency generator output frequency.
9. (Original) The thickness measurement system of claim 1, wherein the processing unit is a personal computer.
10. (Original) The thickness measurement system of claim 1, wherein the cavity resonator is resonant at a natural frequency of approximately 10.6 GHz.
11. (Currently amended) A thickness measurement system for measurement of a film thickness of a sample, comprising:

a resonating means for resonating an electromagnetic signal, having an exposed side adapted to contact a portion of the surface of the sample;

a decoupler means for decoupling signals from the resonating means, and connected to the resonating means;

a signal detecting means for detecting an amplitude of signals from the decoupler means, and connected to the decoupler means;

a processing means for processing, coupled to the signal detecting means;

a frequency signal generating means for generating frequency signals, coupled to the processing means and the decoupler means; ~~and~~

~~a processing means for processing, coupled to the signal detecting means, or having;~~

correlating means for correlating a resonant frequency shift detected by the detecting means to the film thickness of the portion of the surface of the sample being measured; and

suction means for applying a pressure to the resonating means to secure the exposed side of the resonating means to the measurement sample.

~~affixing means for pressing the exposed side of the resonating means against the portion of the surface of the sample.~~

12. (Previously presented) The thickness measurement system of claim 11, wherein the frequency signal generating means utilizes a Gunnplexer to generate frequencies.

13. (Original) The thickness measurement system of claim 11, wherein the resonating means has a plurality of cavities.

14. (Original) The thickness measurement system of claim 11, wherein the frequency signal generating means has Schottky diodes.

15. (Original) The thickness measurement system of claim 12, wherein the Gunnplexer is a Gunn Diode.

16. (Canceled)

17. (Original) The thickness measurement system of claim 11, wherein the detecting means detects a voltage.

18. (Original) The thickness measurement system of claim 11, wherein the detecting means detects a power.

19. (Previously presented) The thickness measurement system of 11, further comprising a DC supply means coupled to the frequency signal generating means.

20. (Original) The thickness measurement system of claim 11, wherein the processing means is a personal computer.

21. (Original) The thickness measurement system of claim 11, wherein the resonating means is resonant at a natural frequency of approximately 10.6 GHZ.

22. (Currently amended) A method for thickness measurement for measuring a film thickness of a sample, comprising the steps of:

abutting an open faced electromagnetic cavity resonator to a portion of the surface of a sample;

affixing the cavity resonator to the surface of the sample with a substantially uniform pressure using a suction assembly;

sweeping frequencies in the cavity resonator using a signal generator having a Gunnplexer;

detecting a resonant frequency of the cavity resonator using a reflected energy detector;  
and

determining the thickness of the film from a correlation of a shift of the resonant frequency.

23. (Original) The method of claim 22, wherein the correlation is based on a first order equation.

24. (New) The method of claim 22, wherein the electromagnetic cavity resonator has a plurality of cavities.

25. (New) The method of claim 22, wherein the signal generator is one of a Gunnplexer or a Gunn Diode.